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PB-266 321

Development of a Comprehensive Water Pollution Control Program for the Lower Mississippi River Basin. Study Plan

Federal Water Pollution Control Administration, Baton Rouge, La

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DEVELOPMENT OF A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE LOWER MISSISSIPPI RIVER BASIN

STUDY PLAN

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
BATON ROUGE, LOUISIANA
APRIL 1966

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SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE DEVELOPMENT OF A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE LOWER MISSISSIPPI RIVER BASIN. STUDY PLAN.		5. REPORT DATE April 1966 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS FEDERAL WATER POLLUTION CONTROL ADMINISTRATION Baton Rouge, Louisiana		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Same as box 9.		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This is a plan to restore and preserve the quality of surface and ground water, eliminate or reduce pollution at its source, remove polluting materials from waste water discharges, and regulation of stream flow. Desires of the public for clean water are identified; desires translated into goals; and engineering and scientific technology is applied to determine alternative methods.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Water quality Lower Mississippi River Basin Water Pollution Control Ground Water Surface Water		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release unlimited. Available from NTIS		68
	20. SECURITY CLASS *(This page)*	22. PRICE PCA04 - A01

EPA Form 2220-1 (9-73)

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I. A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL

The objectives of the program are to restore and preserve the quality of surface and ground water to protect public health and to meet the public's desires and expectations for clean water. The program will meet these objectives in a highly efficient manner through systematic application of a combination of water pollution control measures. These measures include: (1) elimination or reduction of pollution at its source; (2) removal of polluting materials from waste water discharges by treatment methods; (3) control of times of release of waste waters to minimize pollutional effects; and (4) after application of treatment and control at the source, by regulation of stream flow for water quality control.

In the development of this program:

1. Desires and expectations of the public for clean water are identified by consultation with those individuals, industries, municipalities, civic groups, and public officials concerned with the quality of water in the basin.
2. Through an exchange of information between the water users groups and the project staff, public desires are translated into measurable water quality characteristics and water quality goals are established.
3. Engineering, scientific, and economic technology is applied to determine blends of alternative methods of achieving these quality goals and to evaluate their relative effectiveness, dependability, cost, and acceptance.

4. Means and measures for controlling pollution and conserving water quality are implemented as rapidly as possible through coordinated participation of water users, pollution control authorities, construction agencies, and other interest groups.

This program will be developed in cooperation with other Federal agencies, the States, and industries and municipalities concerned, conservation and development of land and water resources.

II. DEVELOPMENT OF A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM For The LOWER MISSISSIPPI RIVER BASIN

A. Authority

The Federal Water Pollution Control Act requires that the Secretary of the Department of Health, Education, and Welfare develop comprehensive water pollution control programs in cooperation with other Federal, State, Interstate, and local water pollution control agencies for eliminating or reducing water pollution in surface and underground sources for all beneficial purposes. The Act also requires that, in the planning of any Federal reservoir, consideration must be given to storage for flow regulation for water quality control. The Secretary of the Department of Health, Education, and Welfare must advise the appropriate Federal construction agency on the need for and the value of such storage.

B. Study Area

The Lower Mississippi River Basin extends from Cairo, Illinois along the Mississippi River to the Gulf of Mexico and includes major tributary drainage areas not covered by other comprehensive water pollution control programs. (See Figure 1.) This Basin includes parts of eight states, and covers an area of approximately 154,000 square miles.

LOWER MISSISSIPPI RIVER BASIN
COMPREHENSIVE WATER POLLUTION
CONTROL PROGRAM

STUDY AREA

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
BATON ROUGE, LOUISIANA

C. Problem Significance

The Lower Mississippi River drains over 40 percent of the contiguous United States and parts of two provinces in Canada. The major water uses in the Project area are water and waste disposal, navigation, recreation, commercial fishing, irrigation, industrial and public water supply and hydroelectric power. The uniqueness of the hydrology in the study area along with an explosive industrial growth along the rivers, population increases, urbanization, and increasing demands for irrigation water have stimulated the need for the optimum uses and protection of water resources. During recent years the rapid industrial growth along the Lower Mississippi River can best be illustrated by the influx of new industries.

During the 1955-65 decade over 2.7 billion dollars in new industry came to Louisiana and settled along the Mississippi and other major rivers.[1/] Missouri reports an investment of over 1 billion dollars by new and expanding industries for the same period.[2/] Other states in the study area have experienced similar industrial growth along the banks of their major rivers. An abundance of industrial water and drain for waste products are major factors influencing this industrial expansion along the banks of the rivers.

Water quality, including distributional patterns, is particularly associated with the economy of the fish and wildlife industries in the study area. The economic importance of the fish and shellfish industry can be illustrated by reference to "Fishery Statistics of the United States", 1963, U. S. Department of the Interior, Fish and Wildlife Service, which shows that the 1963 dockside value exceeded 36 million dollars in the basin states. The 1963 value of processed fishery products in the State of

1/ 1965 "U.S. Department of Commerce and Industry Report"

2/ "Missouri's New and Expanding Industries", 1964, Missouri Division of Commerce and Industrial Development.

Louisiana alone exceeded 58 million dollars. The number of fishermen in the State exceeded 8,000.

Preservation of water quality and quantity in the study area is not only important to the surface water users but also to the groundwater users. Many groundwater supplies in the Mississippi River Basin are in alluvial or delta fill. Water withdrawn from these aquifiers is often replaced by water from the Mississippi River. While pollutants may not currently be in these alluvial aquifers, polluted river water could eventually reach these groundwater supplies.

A large portion of the land area within this Basin is used for agricultural purposes, primarily sugarcane, cotton, rice, and soybeans. In addition, the majority of the Midwest soybean, corn, and wheat belt ultimately drains into the Mississippi River. Surface runoff from these agricultural lands not only stimulate the growth of algae in the stream but increase turbidity and add highly toxic organic materials such as pesticides and herbicides.

The four lower basin States reported 35 pollution-caused fish kills in 1963 and 60 in 1964. Major fish kills occurred in the Mississippi and Atchafalaya Rivers and the Gulf of Mexico in the fall and winters of 1960-1963. It is estimated that over 350 million fish were killed during this period. An investigation of the 1963 fish kill by the U. S. Public Health Service has indicated that the pesticide endrin was the cause of that massive kill. A sharp reduction in freshwater sport fishing is causing much concern in parts of the Lower Mississippi River Delta, with much blame being placed on pesticides. The threat of pesticide contamination of the surface waters from agricultural runoff and chemical manufacturer's discharges can be expected to continue as agricultural usage increases and new chemicals are introduced.

The Mississippi River and its tributaries are used as a water source by approximately 1.8 million people in the study area. The maintenance of a high quality of this potable water will be a major consideration of the Comprehensive Program. On several occasions substantial quantities of materials have been accidently discharged by industries into these rivers so as to adversely affect the quality of these waters. Examples of the more significant of these accidents have involved phenols, oil, carbontetrachloride, phosphate fertilizer and the pesticide toxaphene. Much of the potential danger to the water supplies of the municipalities in Louisiana was avoided by the use of a Waterworks Warning Network Plan developed by the Louisiana Stream Commission and maintained in cooperation with the Louisiana State Board of Health. Such systems are not in effect on the main streams throughout the entire study.

The bacterial pollution of the Mississippi and its tributaries by raw sewage disposal from municipalities will be alleviated as more and better sewage treatment works are built. The potential pollution dangers from these sources will remain, however, as new municipalities develop and others increase in population. The major municipalities of Memphis, Tennessee and New Orleans, Louisiana are still disposing raw sewage into the Mississippi River. Studies are being conducted by the Federal Water Pollution Control Administration between Memphis, Tennessee and Vicksburg, Mississippi and by Tulane University below New Orleans, Louisiana to determine the extent of the bacterial pollution. The city of Vicksburg is designing a new water plant and upon the advice of State and Federal Health Authorities, will change from Mississippi River surface water to a deep well supply because of the dangers of bacterial contamination of the River. The shellfish industry below New Orleans is concerned over the possible bacterial contamination of its oyster beds. Lake Pontchartrain, the large brackish water lake which borders New Orleans, is a popular recreational

facility for the city and surrounding area. Several times during the last few years the lake has been closed to swimming because of bacterial contamination. These problems are representative of the many with which the Comprehensive Program will be concerned during its duration.

Water resources in this study area will be developed to assure a water quality to meet local use requirements so as to provide for a higher level of public health, economic and recreational opportunities throughout the Lower Mississippi River Basin. This will be accomplished through a careful examination of the present physical, chemical and hydrographical characteristics of the waters together with forecasts for future changes.

D. Primary Functions of the Comprehensive Program.

Numerous studies have been conducted in the Lower Mississippi River Basin by local, State, Interstate, and other Federal agencies as well as universities and private agencies. In most cases these studies did not evaluate the effects of water quality for specific beneficial uses of the resources development program. Neither did these studies develop the predictive techniques necessary to determine reasonable estimates of future water quality and quantity problems or the relative effectiveness of alternative abatement measures.

The Lower Mississippi River Basin Comprehensive Water Pollution Control Program is designed to (1) prepare plans for the ultimate development and utilization of water resources on a basin wide approach using mathematical models for evaluation of costs and effects of alternative solutions, (2) make studies to define the biological response to past, present and projected changes in the environment and (3) undertake coordination of efforts of Federal, State and other groups interested in water pollution control.

The data developed in the first two phases of this program will present a display of past and present conditions, will permit economic projection as related to water pollution control, and will provide a base for projecting future water requirements and the regulation of waste discharges. These data will be used for the development of a series of mathematical models to be used to simulate situations and predict effects under various conditions. These models will also provide information relative to the effectiveness of alternative measures and costs which may accomplish a specific pollution control. Optimum decisions may be made not only on

cost reduction, but also on time response. The ultimate plans developed by this program will be sufficiently flexible to allow a choice of alternatives for future generations in the conservation, development and beneficial use of water and related land resources.

E. Functional Statement.

A Comprehensive Program for Water Pollution Control:

1. Restores and preserves the quality of surface and ground water to protect public health and to meet the public's desires and expectations for clean water.

2. Determines the extent and pattern of pollutants of the Lower Mississippi River (from Cairo, Illinois along the Mississippi River to the Gulf of Mexico and includes major tributaries not covered by other comprehensive programs), and of the fish, shellfish, bed material, ground waters, and public water supplies related thereto.

3. Locates the sources of pollutants, such as municipal, industrial, and agricultural uses.

4. Coordinates intra-Departmental research in the overall project plan and incorporates the results with project-developed intelligence to accomplish project objectives. These research areas include such things as: (a) Ecology-mechanisms by which the pollutants move through the water environment and aquatic food chain to fish and shellfish and by which they are concentrated to toxic levels. (b) Community-wide surveys of environmental contamination and the total exposure of man to pollutants. (c) Methods of water treatment to effect maximum pollutant removal.

5. Develops remedial and preventive program to control pollution.

The Office of the Project Director:

1. Interprets Administration policy and establishes the project objectives.

2. Formulates plans and guidelines for accomplishing project objectives.

3. Directs and administers project activities.

4. Reports accomplishment of projects to higher authority.

5. Represents the project before the cooperating public, states, municipalities and industries.

6. Coordinates activities related to collection of necessary project data with various groups of the Federal Water Pollution Control Administration, Department of the Interior, other Federal agencies, such as U. S. Corps of Engineers, Department of Agriculture, Fish and Wildlife Service, State agencies, municipal and local public officials, and other interest groups.

The Office of Administrative Management:

1. Plans and establishes procedures relative to administrative aspects of the project.

2. Procures and manages space, equipment, supplies and services for the project.

3. Advises and assists the Project Director in fiscal affairs.

4. Provides administrative services in area of personnel management.

The Field Operations Section:

1. Plans, directs, and coordinates field operations of project headquarters and the field stations.

2. Through inventories, measurements and sampling programs determines pollution contamination in the surface and ground waters, bed materials, fish and shellfish of the Lower Mississippi River Basin.

3. Locates the sources of pollution such as municipal, industrial, and agricultural uses.

4. Directs fish kill reporting networks and fish kill investigations.

5. Provides advice and service to the entire project in hydrology, sediment transport, biology, oceanography, and agrology.

6. Prepares reports on all field operations.

The Laboratory Section:

1. Provides laboratory support in chemistry, biology, bacteriology, and related sciences at an established facility and on field location.

2. Analyzes samples for specific physical, chemical, biological, and bacteriological characteristics; interprets and reports on findings from all laboratory efforts.

3. Develops appropriate methodology for accomplishing project objectives, including quality control.

4. Provides expertise for the entire project in chemistry and bacteriology.

Damage Assessment and Pollution Control Section:

1. Determines magnitude of damages of pollution to all concerned.

2. Provides intelligence on potential health hazards involving water, fish and wildlife.

3. Prepares mathematical and/or physical models to determine river response to simulated water quantity and quality conditions.

4. Evaluates existing, research, and project-developed information for the purpose of recommending measures to (a) control and prevent pollution, and (b) to minimize the effects of pollution by water treatment and/or ecologic management.

5. Evaluates effectiveness of implemented controls and designs management programs for river basins in study area.

6. Plans and directs programs of information and education.

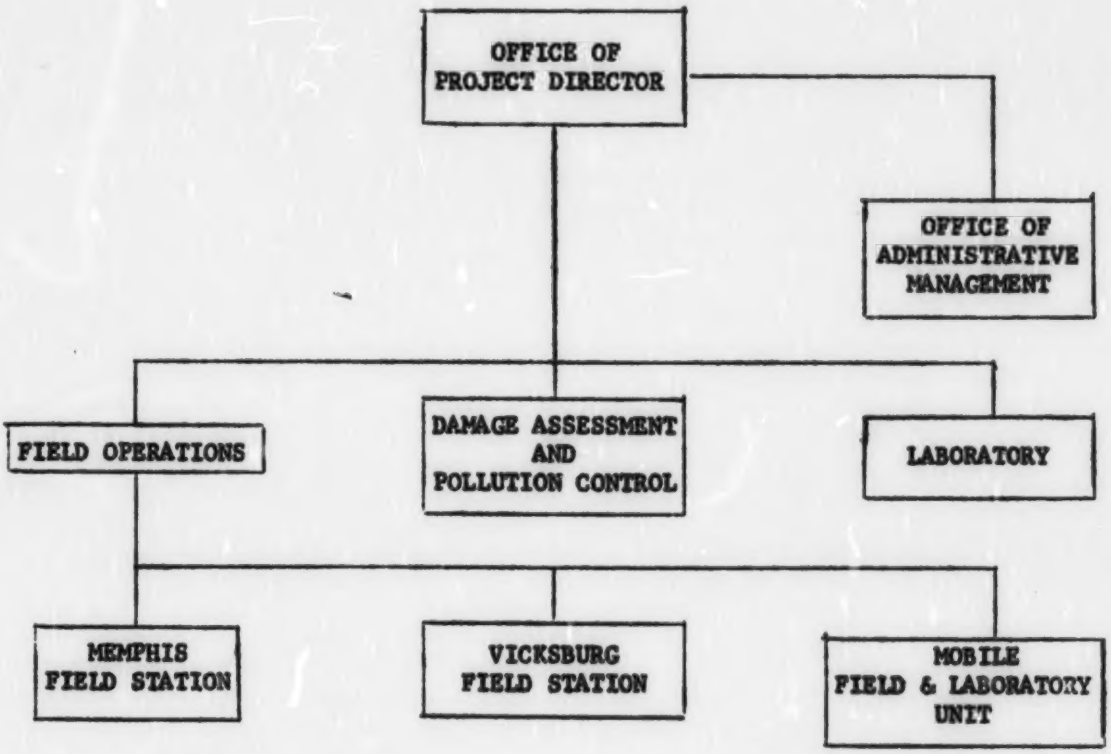
7. Reviews, correlates and reports project accomplishments.

F. Organisation.

Headquarters for the Lower Mississippi River Basin Comprehensive Program will be at Baton Rouge, Louisiana, and field program offices operated at Vicksburg, Mississippi and West Memphis, Arkansas. Additional field program offices may be established and mobile laboratories will be used if required.

It is estimated that five years will be required to complete the development phase of Lower Mississippi River Basin Comprehensive Program, and a program staff of 56 people will be initially required. Additional staff will be required for the management or implementation phases which are to begin in F/Y 1967 for the abatement of endrin pollution as recommended by the Lower Mississippi River Technical Assistance Project and in F/Y 1968 for the first sub-area of the Comprehensive Program area.

ORGANIZATIONAL CHART
LOWER MISSISSIPPI RIVER BASIN COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM



STAFFING ROSTER
LOWER MISSISSIPPI RIVER BASIN WATER POLLUTIO
COMPREHENSIVE PROGRAM

Unit & Position Title	Grade	Series	Position Number	Duty Station	Incumb
OFFICE OF PROJECT DIRECTOR					
Project Director (Supv. San. Engr.)	GS-15	819	EH 64-593	Baton Rouge	Putnic
Deputy Proj. Director (Supv. San. Engr.)	GS-14	819	EH 65-424	Baton Rouge	Standi
Secretary-Stenographer	GS-6	318	EH 64-620	Baton Rouge	Hyatt,
Clerk-Typist	GS-4	322	EH 64-641	Baton Rouge	Beckle
OFFICE OF ADMINISTRATIVE MANAGEMENT					
Administrative Officer	GS-12	341	EH 64-659	Baton Rouge	Marque
Administrative Assistant	GS-9	341		Baton Rouge	Vacant
Administrative Clerk	GS-5	301	EH 65-42	Baton Rouge	String
Clerk-Stenographer	GS-5	312		Baton Rouge	Vacant
Clerk-Typist	GS-4	322		Baton Rouge	Vacant

STAFFING ROSTER
ISSISSIPPI RIVER BASIN WATER POLLUTION CONTROL
COMPREHENSIVE PROGRAM

...es	Position Number	Duty Station	Incumbent	Fiscal Year of EOD	Fiscal Year Termination	Remarks
	EH 64-593	Baton Rouge	Putnicki, G. J.	1965	-	Promotion from GS-14
	EH 65-424	Baton Rouge	Standifer, L.S.	1966	-	Promotion from GS-13
	EH 64-620	Baton Rouge	Hyatt, D.C.	1965	-	Promotion from GS-5
	EH 64-641	Baton Rouge	Beckley, M.C.	1966	-	Incumbent on 700 hr. basis as GS-3 to be promoted to permanent GS-4.
	EH 64-659	Baton Rouge	Marquez, J.E.	1966	-	Promotion from GS-11
		Baton Rouge	Vacant	1967	1971	To be employed 1st Quarter F/Y 1967
	EH 65-42	Baton Rouge	Stringer, E.B.	1965	1966 -	To be abolished at end of F/Y 1966.
		Baton Rouge	Vacant	1966	1971	To be filled in 4th Quarter F/Y 1966
		Baton Rouge	Vacant	1966		To be filled in 4th Quarter F/Y 1966

Unit & Position Title	Grade	Series	Position Number	Duty Station
DAMAGE ASSESSMENT & POLLUTION CONTROL SECTION				
Section Chief	GS-14			Baton Rouge
Biologist	GS-13	401		Baton Rouge
Engineer	GS-12	819		Baton Rouge
Chemist	GS-12	1320		Baton Rouge
Economist	GS-11	110		Baton Rouge
Statistician	GS-11	1530		Baton Rouge
Statistician	GS-11	1530		Baton Rouge
Digital Computer Systems Analyst	GS-9	334		Baton Rouge
Draftsman	GS-7	1371	EH 64-518	Baton Rouge
Clerk-Stenographer	GS-5	312		Baton Rouge
Clerk-Typist	GS-4	322	EH 65-85	Baton Rouge
LABORATORY SECTION				
Section Chief	GS-14	1320	EH 64-591	Baton Rouge
Hydraulic Engineer	GS-13	813		Baton Rouge
Chemist	GS-13	1320	EH 64-592	Baton Rouge
Chemist	GS-11	1320		Baton Rouge
Microbiologist	GS-9	1320	EH 64-796	Baton Rouge
Biologist	GS-11	403		Baton Rouge
Laboratory Technician	GS-9	401		Baton Rouge
Laboratory Assistant	GS-7	1311		Baton Rouge
Laboratory Assistant	GS-4	1311		Baton Rouge
Clerk-Typist	GS-4	1311		Baton Rouge
	GS-3	322		Baton Rouge

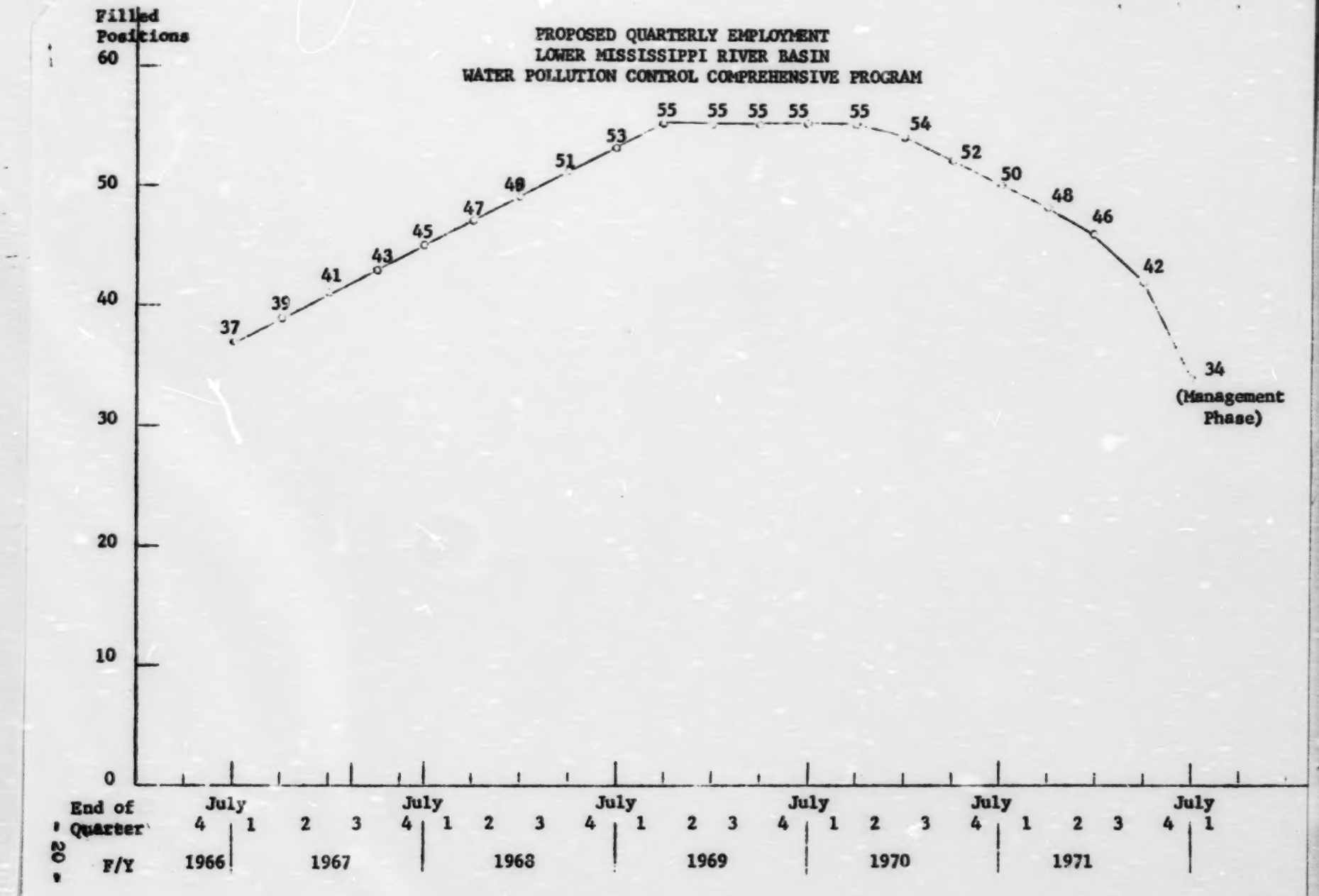
Position Number	Duty Station	Incumbent	Fiscal Year of EOD	Fiscal Year Termination	Remarks
	Baton Rouge	Vacant	1967	1971	
	Baton Rouge	Lambou, V.W.	1966	-	Promotion from GS-11
	Baton Rouge	Butts, T.A.	1965	-	Previously C.O.
	Baton Rouge	Friloux, J.J.	1966	-	Promotion from GS-11
	Baton Rouge	Vacant	1967	1970	
	Baton Rouge	Vacant	1966	1971	
	Baton Rouge	Vacant	1968	1970	
	Baton Rouge	Vacant	1967	1970	
EH 64-518	Baton Rouge	Gonzales, M.P.	1966	1970	Promotion from GS-5
	Baton Rouge	Vacant	1967	-	
EH 65-85	Baton Rouge	Jones, D.B.	1965	1970	Promotion from GS-3
EH 64-591	Baton Rouge	Floyd, E.P.	1965	-	Previously C.O.
	Baton Rouge	Beckers, T.F.	1966	1970	Promotion from GS-12
EH 64-592	Baton Rouge	Myers, L. H.	1965	-	Previously C.O.
	Baton Rouge	Vacant	1967	1970	
EH 64-796	Baton Rouge	Garza, M.E.	1965	1970	Promotion from GS-7
	Baton Rouge	Vacant	1967	-	
	Baton Rouge	Brashier, J.	1966	1970	Promotion from GS-7
	Baton Rouge	Hunt, L. L.	1965	-	Promotion from GS-4
	Baton Rouge	Kilroy,	1965	1970	Promotion from GS-3
	Baton Rouge	Vacant	1966	1970	To be filled 4th Quarter F/Y 1966
	Baton Rouge	Vacant	1968	1970	

Unit & Position Title	Grade	Series	Position Number	Duty Station	Incu
FIELD OPERATIONS SECTION					
HEADQUARTERS					
Section Chief	GS-14	1315	EH 64-595	Baton Rouge	Stow
Assistant Section Chief (Engineer)	GS-13	819		Baton Rouge	Shum
Engineer	GS-9	819		Baton Rouge	Vaca
Biologist	GS-11	401		Baton Rouge	Vaca
Biologist	GS-11	401	EH 64-791	Baton Rouge	Geck
Biologist	GS-11	401		Baton Rouge	Doug
Biologist	GS-12	401		Baton Rouge	Vaca
Engineering Aide	GS-5	802		Baton Rouge	Prit
General Mechanic	WB-8	4740	EH 64-700	Baton Rouge	Purp
Boat Operator	WB-8	5903	EH 64-792	Baton Rouge	Tate
Aquatic Sampler	WB-3	3501	EH 64-661	Baton Rouge	Vaca

eries	Position Number	Duty Station	Incumbent	Fiscal Year of EOD	Fiscal Year Termination	Remarks
315	EH 64-595	Baton Rouge	Stow, J. M.	1965	-	Promotion from GS-13
819		Baton Rouge	Shunatona, B. B.	1965	-	Previously C. O.
819		Baton Rouge	Vacant	1967	1970	
401		Baton Rouge	Vacant	1966	1970	To be filled 4th Quarter F/Y'66
401	EH 64-791	Baton Rouge	Geckler, J. R.	1965	1970	
401		Baton Rouge	Douglas, E. H.	1965	1970	Previously C. O.
401		Baton Rouge	Vacant	1967	-	To be filled by one of three GS-11 Biologists
302		Baton Rouge	Pritchard, B. J.	1965	-	Promotion from WB-3
740	EH 64-700	Baton Rouge	Purpera, C. D.	1965	1970	
303	EH 64-792	Baton Rouge	Tate, J. L.	1965	-	Promotion from WB-4
301	EH 64-661	Baton Rouge	Vacant	1966	1970	To be filled 4th Quarter F/Y'66

Unit & Position Title	Grade	Series	Position Number	Duty Station	Incumben
MEMPHIS FIELD STATION					
Chief of Station (Engineer)	GS-12	819	EH 64-660	West Memphis	Rike, H.
Engineering Technician	GS-9	802	EH 65-996	West Memphis	Alleman,
Biologist	GS-7	401	EH 64-594	West Memphis	Trelanne
Aquatic Sample Collector	WB-3	3501		West Memphis	McDaniel
Boat Operator	WB-8	5903		West Memphis	Vacant
Clerk-Typist	GS-4	322	EH 64-745	West Memphis	Holmes,
VICKSBURG FIELD STATION					
Chief of Station (Engineer)	GS-11	819		Vicksburg	Gazda, C
Aquatic Sample Collector	WB-3	3501		Vicksburg	Storey,
Boat Operator	WB-8	5903		Vicksburg	Hebert,
Clerk-Typist	GS-3	322		Vicksburg	Vacant
MOBILE FIELD & LABORATORY UNIT					
Chief of Station (Engineer)	GS-11	819		-	Vacant
Biologist	GS-7	401		-	Vacant
Aquatic Sample Collector	WB-3	3501		-	Vacant
Boat Operator	WB-8	5903		-	Vacant
Chemist	GS-7	1320			Vacant

Series	Position Number	Duty Station	Incumbent	Fiscal Year of EOD	Fiscal Year Termination	Remarks
819	EH 64-660	West Memphis	Rike, H.B.	1965	1970	Previously C.O.
802	EH 65-996	West Memphis	Alleman, J.C.	1965	1970	
401	EH 64-594	West Memphis	Trelanney, F.R.	1966	1970	Promotion from GS-5
3501		West Memphis	McDaniel, R.E.	1966	1970	
5903		West Memphis	Vacant	1967	1970	
322	EH 64-745	West Memphis	Holmes, V.C.	1965	1970	
819		Vicksburg	Gazda, C.A.	1965	1970	Previously C.O.
3501		Vicksburg	Storey, J.	1966	1969	
5903		Vicksburg	Hebert, A.	1965	1969	
322		Vicksburg	Vacant	1967	1969	
819		-	Vacant	1968	1969	
401		-	Vacant	1968	1969	
3501		-	Vacant	1968	1969	
5903		-	Vacant	1968	1969	
1320			Vacant	1968	1969	


PROPOSED QUARTERLY EMPLOYMENT
LOWER MISSISSIPPI RIVER BASIN
WATER POLLUTION CONTROL COMPREHENSIVE PROGRAM
Filled Positions
60
50
40
30
20
10
0
37
39
41
43
45
47
49
51
53
55 55 55 55 55
54
52
50
48
46
42
34
(Management Phase)
End of Quarter
July 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
F/Y
1966
1967
1968
1969
1970
1971

G. ANALYSIS OF EXISTING AND PROJECTED SPACE NEEDS F.Y. 1966, 1967, 1968, 1969, 1970, 1971

ANALYSIS OF EXISTING AND PROJECTED SPACE NEEDS
F.Y. 1966, 1967, 1968, 1969, 1970, 1971
LOWER MISSISSIPPI RIVER BASIN WATER POLLUTION CON
COMPREHENSIVE PROGRAM

Major Organizational Unit	Location	Utilization	Sq. Ft.	1966	1967	1968	196
Project Headquarters	2695 N. Sherwood Forest Drive Baton Rouge, La.	Office for Headquarters Components Incl. Labs & Storage	7072	3,536	17,714	17,714	17,
Memphis Area Fld Sta.	306 E. Bond St. West Memphis, Arkansas	Office for Field Sta. Incl. Lab Space	1010	2,580	2,580	2,580	2,
Vicksburg Area Fld Sta.	Natl. Park Serv. Admin. Hqs. Vicksburg, Miss.	Office for Field Sta.	2050	300	300	300	
		TOTAL	10132	6,416	20,594	20,594	20,

XISTING AND PROJECTED SPACE NEEDS
, 1967, 1968, 1969, 1970, 1971
I RIVER BASIN WATER POLLUTION CONTROL
COMPREHENSIVE PROGRAM

q. ft.	1966	1967	1968	1969	1970	1971	Date of Occupancy	Remarks
7072	3,536	17,714	17,714	17,714	17,714	14,000	11-64	Prsent quarters inadequate for full staff of 56 employees. Anticipate renting approximately 2700 sq. ft. of commercial office
1010	2,580	2,580	2,580	2,580	2,580	-	2-65	space at approximate cost of $5.00 per sq. ft. This space will house the major headquarters office con-
2050	300	300	300	300	-	-	7-65	sisting of approximately 20 people.
0132	6,416	20,594	20,594	20,594	20,294	14,000		

OFFICE SPACE - OCCUPANCY BY GRADE AND FOOTAGE
LOWER MISSISSIPPI RIVER BASIN WATER POLLUTION CON
COMPREHENSIVE PROGRAM

Grade	Sq. Ft. Allow. Per Person	Fiscal Year Ending June 30, 1966		Budget Fiscal Year 1967		Budget Fiscal Year 1968		Budget Fiscal Ye 1969	
		Number of Authorized Positions Pre-Comp. Program	Number Sq. Ft. Allowed	Anticipated Employees Reqd. for Comp. Prog.	Number Sq. Ft. Required	Anticipated Employees Reqd. for Comp. Prog.	Number Sq. Ft. Required	Anticipated Employees Reqd. for Comp. Prog.	Numb Sq. Req
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(
GS 1-6	100	20	2,000	22	1,900*	NC	NC	16	1,9
GS 7-11 Supv.	100	1	100	3	200*	NC	NC	2	2
GS 7-11 Non Supv	100	8	800	17	1,600*	NC	NC	15	1,6
GS 12-13 Supv.	150	5	750	6	900	NC	NC	6	9
GS 12-13 Non Supv	100	4	400	3	300	NC	NC	3	3
GS 14-15 Supv.	250	1	250	5	1,250	NC	NC	5	1,2
GS 14-15 Non Supv	150								
GS 16,17, 18	300								
TOTALS		39	4,300	56	6,150			47	6,1

* 6 Employees budgeted for F.Y. 1967 will man and operate a Mobile Unit and do not require office sp

PACE - OCCUPANCY BY GRADE AND FOOTAGE
SIPPI RIVER BASIN WATER POLLUTION CONTROL
COMPREHENSIVE PROGRAM

dget Fiscal Year 1968		Budget Fiscal Year 1969		Budget Fiscal Year 1970		Budget Fiscal Year 1971	
ticipated loyees qd. for p. Prog.	Number Sq. Ft. Required	Anticipated Employees Reqd. for Comp. Prog.	Number Sq. Ft. Required	Anticipated Employees Reqd. for Comp. Prog.	Number Sq. Ft. Required	Anticipated Employee Reqd. to Phase Out Comp. Prog.	Number of Sq. Ft. Required
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
NC	NC	16	1,900	6	1,300	5	500
NC	NC	2	200	1	-	0	-
NC	NC	15	1,600	4	1,300	3	300
NC	NC	6	900	4	600	4	600
NC	NC	3	300	3	300	3	300
NC	NC	5	1,250	5	1,250	4	1,000
		47	6,150	23	4,750	19	2,700

ile Unit and do not require office space.

SPECIAL PURPOSE SPACE INVENTORY AND PROJECTED SPAC
LOWER MISSISSIPPI RIVER BASIN WATER POLLUTION
COMPREHENSIVE PROGRAM

	Pre-Comprehensive Fiscal Year 1966		Comprehensive Program Fiscal Year 1967		Comprehensive Program Fiscal Year 1968		Compre Pro Fiscal Y
	Total Authorized Employees	Acquired and/or Requested	Total Anticipated Employees Required for Comprehensive Program	Space Required for Comp. Program	Employees Required for Comp. Program	Space Required for Comp. Program	Employees Required for Comp. Program
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Laboratory Space	-	1,155	-	1,655*	-	NC	-
2. Other Related Space							
a. Office Space	37	3,099	56	6,690**	NC	NC	47
b. Conference Room	-	328	-	328	-	NC	-
c. Storage & Supply	-	4,021	-	4,648	-	NC	-
d. Repair Shops	-	-	-	260	-	NC	-
e. Special Chromatography Room	-	106	-	106	-	NC	-
f. Drafting Room	-	121	-	121	-	NC	-
g. Hallways, Stairwells, Lavoratories	-	1,590	-	1,590	-	NC	-
h. Glass Wre. Wash Rm	-	40	-	260	-	NC	-
TOTAL	37	10,460	56	15,658	NC	NC	47

* One additional lab will be required for the Comprehensive Program
** Present office inadequate for 56 employees. Additional office space will be required

RPOSE SPACE INVENTORY AND PROJECTED SPACE REQUIREMENTS
MISSISSIPPI RIVER BASIN WATER POLLUTION CONTROL
COMPREHENSIVE PROGRAM

e 67	Comprehensive Program Fiscal Year 1968		Comprehensive Program Fiscal Year 1969		Comprehensive Program Fiscal Year 1970		Comprehensive Program Fiscal Year 1971	
ace uired Comp. ogram	Employees Required for Comp. Program	Space Required for Comp. Program	Employees Required for Comp. Program	Space Required for Comp. Program	Employees Required for Comp. Program	Space Required for Comp. Program	Employees Required to Phase Out Comprehensive Program	Space Required to Phase Out Comprehensive Program
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
,655*	-	NC	-	NC	-	1,655	-	500
,690**	NC	NC	47	NC	23	6,330	19	2,700
328	-	NC	-	NC	-	328	-	-
,648	-	NC	-	NC	-	2,958	-	500
260	-	NC	-	NC	-	260	-	-
106	-	NC	-	NC	-	106	-	-
121	-	NC	-	NC	-	121	-	-
,590	-	NC	-	NC	-	1,590	-	-
260	-	NC	-	NC	-	260	-	-
,658	NC	NC	47	NC	23	13,608	19	3,700

ive Program
l office space will be required

H. WORKING BUDGET

WORKING BUDGET
Request for Funds, Fiscal Year 1967

Region and Location: Region VII, Baton Rouge, La.
Program/Project No. and Title: 206/620
1967 Allowance No.: 7-3170

		1966 Actual	1967 Request	Increase/ Decrease
1.	Request			
11	Personnel Compensation (Total)	245,500	298,000	
	Compensation other than consultants	(244,500)	298,000	
	Consultants' fees	(1,000)	0	
12	Personnel Benefits	32,300	31,800	
21	Travel	44,000	43,200	
	Change of station incl. dep. and dislocation allowance	(2,000)	(2,000)	
	Other travel	(42,000)	(41,200)	
22	Transportation of things	6,000	10,800	
	Change of Station	(4,000)	(4,000)	
	Other	(2,000)	(6,800)	
23	Rents, communications & utilities (excludes space rental)	9,400	13,200	
24	Printing & Reproduction	300	8,000	
25	Other Services	57,500	98,200	
	Contracts	(27,000)	(23,700)	
	Woodson-Tenent Labs 6,000			
	Data Processing 15,000			
	Boat Operation 2,700			

WORKING BUDGET (cont'd)

		1966 Actual	1967 Request	Increase/ Decrease
	Other	(30,500)	(74,500	
	USGS 45,000 Fish census 10,000 Corps Engrs. 4,500 US Fish & Wildlife 15,000			
26	Supplies and Materials	24,000	34,500	_____
31	Equipment	12,000	12,300	_____
	TOTAL	431,000	550,000	_____

I. Study Plan.

The objectives of the Lower Mississippi River Basin Water Pollution Control Comprehensive Program are to:

1. Determine the sources and quantities of water pollutants.
2. Determine the extent and pattern of water pollution.
3. Determine and predict the effects of water pollution.
4. Determine water use requirements.
5. Prepare plans for restoring and preserving water quality.

To meet these objectives the program is divided into three phases. They are:

I. An Iventory and Projection of Waste Loads and Water Uses.

II. A Study of the Extent and Pattern of Pollution.

III. An Evaluation of the Alternative Methods for the Control and Prevention of Pollution.

PHASE I

AN INVENTORY AND PROJECTION OF WASTE LOADS AND WATER USES

Purpose

The purpose of this phase will be to compile an inventory of existing and potential waste discharges and water uses; this will provide basic information for evaluating the effects of different waste disposal techniques, alternative waste treatment methods, and stream flow regulation for beneficial water uses. Mathematical model projections will be made of effects of known and assumed waste concentrations and water uses.

Scope

Phase I will include the following studies:

1. Estimates of present and future populations and industrial development (to the year 2020).
2. Estimates of quantity and quality of municipal and industrial wastes and the determination of the probable points of discharge.
3. Projections of quantity and quality of water need for sport and commercial fisheries, wild life, and recreation.
4. Determination of present and future land usage, practices. This will include estimating existing and future irrigated lands, crop acreages, and agricultural runoff.
5. Investigate the hydrologic and hydraulic features of the program study area. This will provide information on potential quantities of water available for maintaining specific concentrations of pollutants in the receiving waters. Also, it will supply information concerning the mechanism by which pollutants from agricultural land use reach streams and ground waters.
6. Estimates of existing and future ground water uses and problems of salt water intrusion on both ground and surface waters.
7. Identification and location of existing and predicted future beneficial water uses, and an estimation of the quantities and qualities of water required for each use.

PHASE II

A STUDY OF THE EXTENT AND PATTERN OF POLLUTION

Purpose

The purpose of this phase will be to verify and supplement the data compiled under Phase I and to determine the existing quality of surface and ground waters. Also, certain programs initiated under the Lower

Mississippi River Technical Assistance Project will be carried through Phase I and Phase II.

Scope

Phase II will include the following studies:

1. Verification of the estimates of the sources and quantities of wastes determined under Phase I. This will be accomplished by field investigations, surveys, and sampling supplemented and supported by laboratory analyses.
2. Extent of pollution and its effect on the receiving waters and aquatic biota will be investigated. This will include the continuation of existing programs started by the Lower Mississippi River Technical Assistance Project.

   Programs to be continued from the Lower Mississippi River Technical Assistance Project are:

   1. The Lower Mississippi and Atchafalaya Rivers Fish Survey.
   2. Micro-invertabrate sampling using permanently installed substrate samplers.
   3. Surveillance of pesticides in water, bed material, fish and shellfish in the main stems of the Mississippi and Atchafalaya Rivers and associated estuarine areas as well as in major tributaries.

PHASE III

AN EVALUATION OF THE ALTERNATIVE METHODS FOR THE CONTROL AND PREVENTION OF POLLUTION

Purpose

Alternative methods for pollution control and the prevention of pollu-

tion will be devised. These will be evaluated and information will be developed on the costs and effects of each to permit the selection of logical schemes for control.

Scope

Phase III will involve:

1. The selection of alternatives for pollution control and abatement.
2. Actual costs of implementing each alternative system or method of pollution control will be investigated.
3. Water uses affected by each alternative will be identified and damages to these water uses caused by each alternate will be evaluated.
4. The costs and benefits or detriments of each alternative will be compared, evaluated and presented, with the development and use of mathematical models to provide a basis for the selection of a plan of action.
5. A definite plan of water pollution control will be finalized for use during the management phase.

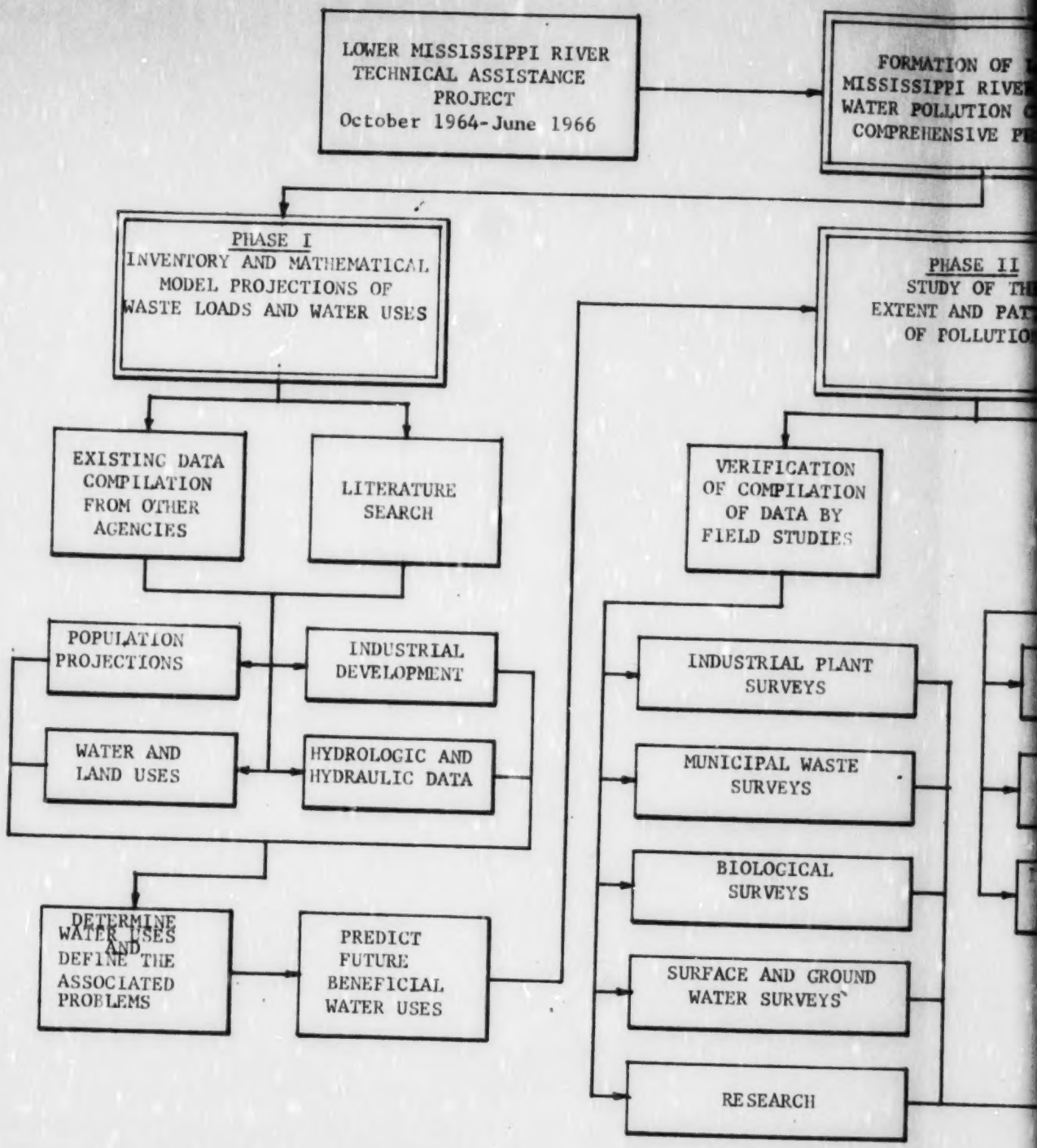
See Activity Network Chart (Figure 2) for basic outline of activities and goals.

J. Subareas for Study

The Project area will be divided into five subareas for study. These subareas generally have common hydrology, water uses and water quality problems. The subareas are discussed below and are listed according to study priority.

1. Mississippi River from Helena, Arkansas upstream to Cairo, Illinoi includes the St. Francis River Basin and minor basins in Kentucky

LOWER MISSISSIPPI RIVER BASIN WATER POLLUT
ACTIVITY NETWORK



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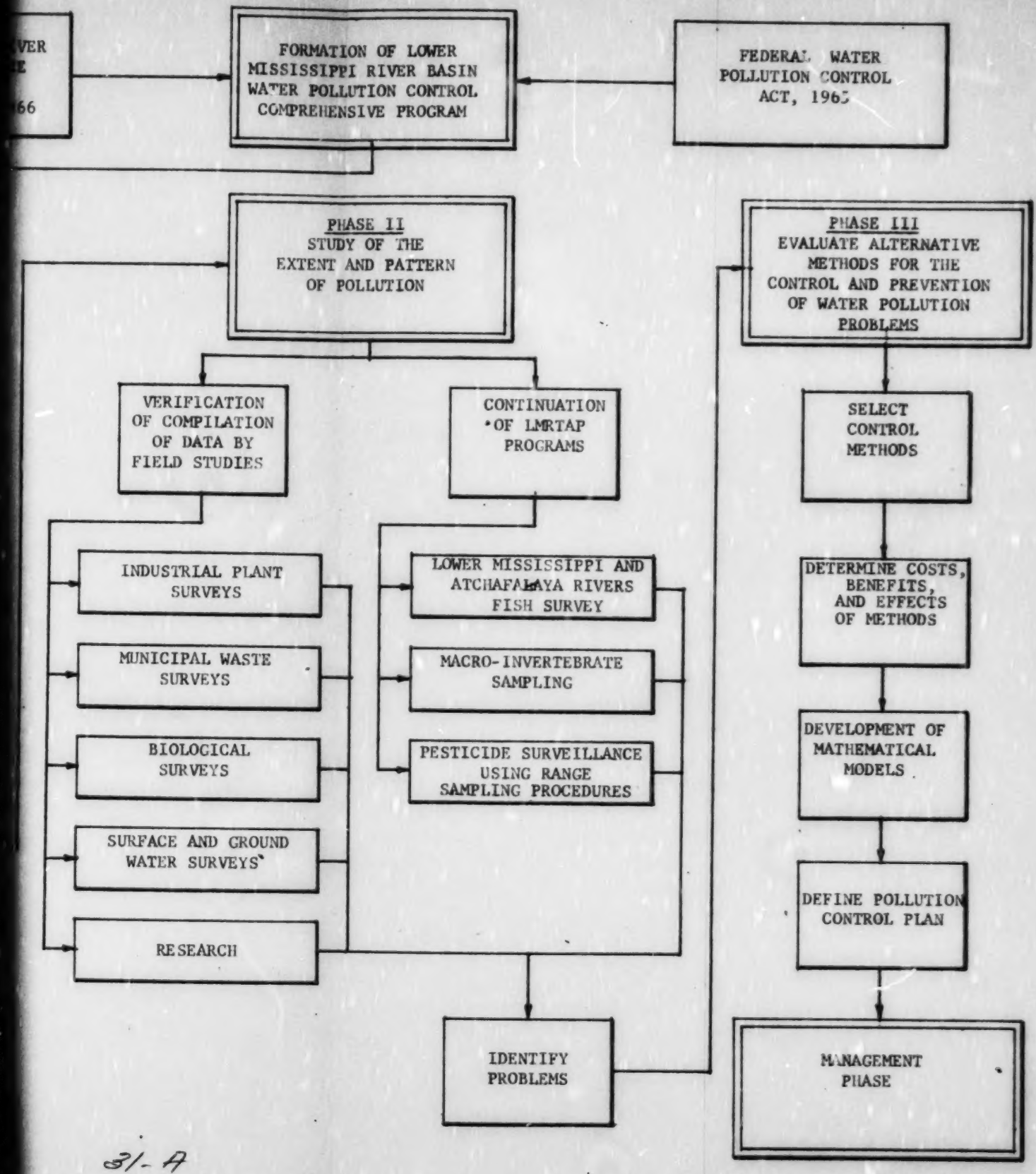
ACTIVITY NETWORK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FORMATION OF LOWER MISSISSIPPI RIVER BASIN WATER POLLUTION CONTROL COMPREHENSIVE PROGRAM
FEDERAL WATER POLLUTION CONTROL ACT, 1965
PHASE II
STUDY OF THE EXTENT AND PATTERN OF POLLUTION
PHASE III
EVALUATE ALTERNATIVE METHODS FOR THE CONTROL AND PREVENTION OF WATER POLLUTION PROBLEMS
VERIFICATION OF COMPILATION OF DATA BY FIELD STUDIES
CONTINUATION OF LMRTAP PROGRAMS
SELECT CONTROL METHODS
INDUSTRIAL PLANT SURVEYS
LOWER MISSISSIPPI AND ATCHAFALAYA RIVERS FISH SURVEY
DETERMINE COSTS, BENEFITS, AND EFFECTS OF METHODS
MUNICIPAL WASTE SURVEYS
MACRO-INVERTEBRATE SAMPLING
BIOLOGICAL SURVEYS
PESTICIDE SURVEILLANCE USING RANGE SAMPLING PROCEDURES
DEVELOPMENT OF MATHEMATICAL MODELS
SURFACE AND GROUND WATER SURVEYS
DEFINE POLLUTION CONTROL PLAN
RESEARCH
IDENTIFY PROBLEMS
MANAGEMENT PHASE

31-A

Tennessee which drain into the Mississippi River. Anticipated problems are related to industrial and untreated municipal wastes discharged in the Memphis, Tennessee area and the contributions from tributaries and the upper Mississippi River.

2. Mississippi River from Old River, Louisiana downstream to the Gulf of Mexico - includes drainage to Lake Pontchartrain and esturaine areas affected. Anticipated problems are associated with wastes from industries located along the Mississippi River and untreated municipal wastes from New Orleans.

3. Red River downstream from Dennison, Texas, Ouachita, Black and Atchafalaya River Basins - includes the estuarine areas affected. Main pollution problems will be those associated with agriculture and oil fields.

4. Mississippi River from Helena, Arkansas downstream to Old River, Louisiana - includes the Arkansas downstream from Ft. Smith, Arkansas, White, Yazoo and Big Black River Basins. Anticipated pollution problems are those associated with agriculture, municipal and industrial waste in slack water (navigable portion of Arkansas River) and municipal and industrial wastes in the Natches, Vicksburg and Greenville, Mississippi areas.

5. Southwest Louisiana - includes Calcasieu and Vermilion River Basins and affected estuarine areas. Pollution problems are associated with agriculture (sugarcane and rice) and with salt water intrusion